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(54) Title: OPTICAL DETECTION OF ANALYTES BY USE OF SEMICONDUCTOR NANOPARTICLES

(57) **Abstract:** The present invention provides an optical method and device for the determination of an analyte in an assayed sample. The method and device of the invention are based on the use of semiconductor nanoparticles that carry a recognition agent. The detection is based on fluorescence resonance energy transfer (FRET) between the semiconductor nanoparticle donors, which are excited with electromagnetic radiation, and acceptors in the form of dye-labeled or semiconductor nanoparticle-labeled agents, that are immobilized to the recognition agent in the presence of the analyte and under assay conditions. The method and device of the present invention are especially useful in the determination of DNA or RNA analytes, DNA polymerase or telomerase analytes, cancer cells through telomerase activity and single-base mutations. In such cases the recognition agent is a single-stranded oligonucleotide.